IDENTIFICATION

PRODUCT CODE:	MAINDEC-8E-D1FB-D
PRODUCT NAME:	PDP-8E EXTENDED MEMORY ADDRESS TEST (EA8E)
DATE:	JUNE 14, 1971
MAINTAINER:	DIAGNOSTIC GROUP
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1. ABSTRACT

The PDP-8E Extended Memory Address Test is designed to detect any location that cannot be uniquely addressed. This is performed by a series of four test routines which will test systems equipped with from 8K to 32K words of core memory. Automatic program relocation is provided in order to test all memory fields from each memory field. Teletype print-outs are provided for error identification, and the operator is given a degree of control over the program by various SR settings.

2. REQUIREMENTS

2.1 Equipment

A PDP-8E computer equipped with a minimum of 8K words of core memory.

2.2 Storage

The program occupies core locations ØØØØ to 3777.

2.3 Preliminary Programs

The Binary Loader must be in memory. Also, all diagnostics for a basic 4K PDP-8E must have been previously run successfully.

3. LOADING PROCEDURE

Load the program with the Binary Loader (BIN). The program may be loaded into any desired core stack by having BIN in that core stack.

4. OPERATING PROCEDURE

4.1 Program and Operator Action

A. Set the SR to the INSTRUCTION FIELD and DATA FIELD of the stack which contains the program.

B. Press key EXTD ADDR LOAD.

C. Set the SR for desired starting address according to the following table.

ADDRESS	TEST EXECUTION
Ø2ØØ	Run all tests
Ø2Ø1	Run only test 1
Ø2Ø2	Run only test 2
Ø2Ø3	Run only test 3
Ø2Ø4	Run only test 4

D. Press keys ADDR LOAD, CLEAR, and CONT. A setup SR message will be printed.

E. Set the SR for desired operation according to the following table.

SWITCH	Ø (down)	1 (up)
SRØØ	continue after error	halt after error
SRØ1	typeout errors	inhibit error typeouts
SRØ2	normal	TTY bell on error
SRØ3	relocate program	inhibit program relocation
SRØ4	normal	change stack limits
SRØ5	normal	halt after current test
SRØ6-Ø8	starting stack limit (Ø-7)	
SRØ9-11	ending stack limit (Ø-7)	

F. Press key CONT.

4.2 Detailed SR Explanation

SRØØ-Ø2 SRØ2, if set, will ring the TTY bell once for each error. SRØØ and SRØ1 have no effect with SRØ2 set.

SRØ3 SRØ3 may be set or reset at any time and the program will act accordingly

SRØ4 SRØ4 allows the operator to change the stack limits as defined by SRØ6-11.

SRØ5 SRØ5 is normal halt for program

SRØ6-Ø8 These switches define the starting stack limit (normally Ø).

SRØ9-11 These switches define the ending stack limit (normally 7)

4.3 Example of Selecting Stacks for Test

Example 1: SR = ØØØ7, 28K system

Stacks selected for testing are 6,5,4,3,2,1,Ø

Example 2: SR = ØØØ4, 28K System

Stacks selected for testing are 4,3,2,1,Ø

Example 3: SR = ØØ22 28K System

Stacks selected for testing are 2
(No relocation will occur)

Example 4: SR = ØØ41 28K System

Stacks selected for testing are 6,5,4,1,Ø

NOTE 1: Stacks not in the system are automatically de-selected as is Example 1. Stack 7 is not present therefore not selected.

NOTE 2: A single stack can be selected for testing providing the program is not in that stack as in Example 3.

NOTE 3: Any stack or group of stacks can be by-passed as in Example 4. Stacks 2 and 3 are not selected, stack 7 is not present.

5. ERRORS

The contents of a given memory test location should always be equal to its address or the complement of its address. If it is not, a test error will result. A relocation error will occur if the relocation comparison check fails.

5.1 Test Error Typeouts

For the first error encountered a header will be typed out followed by the pertinent data. For all subsequent errors, only the pertinent data will be typed. The format is as follows:

```
PR  LOC  ADDR   GOOD   BAD   TEST
```

PR LOC = the program address where the error JMS occurred.
(Includes Field)

ADDR = the address of the location in error. (Includes Field)

GOOD = what the data should be.

BAD = what the data is.

TEST = the test (1-4) running when the failure occurred.

5.2 Relocation Error Typeouts

All relocation errors are in the following format:

XXXXX RELOCATION ERROR AT LOCATION_YYYYY

XXXXX = the program address where the error JMS occurred, (Includes Field)

YYYYY = the address of the location in error (Includes Field)

NOTE: After each error print-out the program continues on with the next sequential memory location.

6. RESTRICTIONS

6.1 Starting Restrictions

The program may be restarted at any time from location Ø2ØØ of the stack the program is presently in.

6.2 Operating Restrictions

None

7. EXECUTION TIME

The time to run all 4 tests in one core stack is approximately 1/2 second. During program execution a 5 will be typed on the TTY approximately every 5 minutes of program run time. This allows the operator to determine approximate run time before a failure occurred.

8. SCOPE LOOPS

Two special scope loops have been provided in this program.

8.1 Scope Loop 1

This scope loop writes the value equal to the address specified by the SR into the address specified by the SR. It then loops doing a write-read.

8.1 continued

The address being looped on can be changed simply by changing the switch setting.

A. Set the SR to the INSTRUCTION FIELD that the program is in and the DATA FIELD wanted to test.

B. Press key EXTD ADDR LOAD.

C. Set the SR equal to 34ØØ.

D. Press key ADDR LOAD.

E. Set the SR equal to the address to test.

F. Press keys CLEAR, and CONT.

8.2 Scope Loop 2

This scope loop is the same as Scope Loop 1 except that a group of addresses may be specified. The starting address specified must be less than the ending address specified.

A. Set the SR to the INSTRUCTION FIELD that the program is in and the DATA FIELD wanted to test.

B. Press key EXTD ADDR LOAD.

C. Set the SR equal to 36ØØ.

D. Press key ADDR LOAD

E. Set the SR equal to the first address of the group

F. Press keys CLEAR and CONT. A halt will occur at address 36Ø2.

G. Set the SR equal to the last address of the group.

H. Press key CONT.

NOTE 1: The address(s) specified will be looped unti stopped by the operator with key HALT. No error checking is done. To resume normal operation, restart program at address Ø2ØØ-Ø2Ø4 of the current instruction field.

9. PROGRAM DESCRIPTION

9.1 General

The PDP-8E Extended Memory Address Test is intended for use with a PDP-8E equipped with the extended memory option. A total of four tests are executed by the program. (See 9.2 thru 9.5). Each test writes a unique pattern into core memroy and the checks for error. The patterns were chosen to aid the operator in the event of addressing errors.

The program automatically relocates itself to each memory field under test to ensure that all fields may be correctly referenced from any field. Fields not present in the system will automatically be de-selected from testing. (See 9.6)

Control of the program is given to the operator by means of the SR. The operator may halt after error, inhibit error printouts, substitute TTY BELL for error indication, halt after test, change field test limits, select all or any one of four tests, inhibit program relocation, and at any time restart the program at location Ø2ØØ thru Ø2Ø4.

9.2 Test 1

Test 1 writes the value of each location into itself in the forward direction. Then each location is read and checked in the forward direction.

9.3 Test 2

Test 2 writes the complement value of each location into itself in the forward direction. Then each location is read and checked in the forward ddrection.

9.4 Test 3

Test 3 writes the value of each location into itself in the reverse direction. Then each location is read and checked in the reverse direction.

9.5 <u>Test 4</u>

Test 4 writes the complement value of each location into itself in the reverse direction. Then each location is read and checked in the reverse direction.

9.6 <u>Program Relocation</u>

Program relocation is governed by the status of SR bit 3 or by the fact that only one stack is selected for testing. With SR bit 3 down (Ø position) program relocation occurs each time the test pattern and its complement have been completely tested in each selected stack. The program first relocates to the highest order 4K stack under test. The program keeps relocating to the next lower stack under test until it reaches the lowest order stack under test. The testing and relocation cycle is then repeated. The contents of the entire stack are relocated which enables any other information (RIM-BIN) to be carried with the program.

The program provides a degree of protection for itself by remembering all stacks where errors occur. When a faulty stack is next in sequence to contain the program, the program willskip the faulty stack and relocate to the first lower order stack which is error free . If all other selected stacks are faulty, program relocation will not take place.

During relocation a comparison check is made to insure no program loss.

For further understanding of how the tests are performed, refer to the listing.

```
        /EXTENDED ADDRESS TEST FOR KM8-E EXTENDED MEMORY (VER  )
        /COPYRIGHT 1971, DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS. Ø1754
        /PROGRAMMER, VERNON FREY
        /
        /
        /SWØ=1          HALT AFTER ERROR
        /SW1=1          INHIBIT ERROR TYPEOUT
        /SW2=1          BELL ON ERROR (USEFUL FOR MAINTENENCE)
        /SW3=1          INHIBIT PROGRAM RELOCATION
        /SW4=1          CHANGE STACK LIMITS
        /SW5=1          HALT AFTER CURRENT TEST
        /SW6-SW8        STARTING STACK LIMIT (Ø-7)
        /SW9-SW11       ENDING STACK LIMIT (Ø-7)
        /
        /
        /
        /PROGRAM STARTING ADDRESS
        /Ø2ØØ           RUN ALL TESTS
        /Ø2Ø1           RUN ONLY TEST 1
        /Ø2Ø2           RUN ONLY TEST 2
        /Ø2Ø3           RUN ONLY TEST 3
        /Ø2Ø4           RUN ONLY TEST 4
        /
        /
        /
        /


        /
        /IOT COMMANDS FOR THE MC8-E EXTENDED MEMORY & INTERRUPT
        /
6ØØ4    GTF=6ØØ4        /GET INTERRUPT FLAGS
                        /ACØ    LINK
                        /AC1    GREATER THAN FLAG
                        /AC2    INTERRUPT BUS
                        /AC3    INTERRUPT INHIBIT FLIP-FLOP
                        /AC4    INTERRUPT ON
                        /AC5    USER FLAG
                        /AC6-8  INSTRUCTION FIELD
                        /AC9-11 DATA FIELD
6ØØ5    RTF=6ØØ5        /RESTORE INTERRUPT FLAGS
                        /ACØ    LINK
                        /AC1    GREATER THAN FLAG
                        /1      INTERRUPT INHIBIT FLIP-FLOP
                        /1      INTERRUPT ON
                        /AC5    USER FLAG
                        /AC6-8  INSTRUCTION BUFFER
                        /AC9-11 DATA FIELD
62Ø1    CDFØ=62Ø1       /CHANGE TO DATA FIELD Ø
6211    CDF1=6211       /CHANGE TO DATA FIELD 1
6221    CDF2=6221       /CHANGE TO DATA FIELD 2
6231    CDF3=6231       /CHANGE TO DATA FIELD 3
6241    CDF4=6241       /CHANGE TO DATA FIELD 4
6251    CDF5=6251       /CHANGE TO DATA FIELD 5
6261    CDF6=6261       /CHANGE TO DATA FIELD 6
```

```
           6271    CDF7=6271        /CHANGE TO DATA FIELD 7
           6202    CIFØ=6202        /CHANGE TO INSTRUCTION FIELD Ø
           6212    CIF1=6212        /CHANGE TO INSTRUCTION FIELD 1
           6222    CIF2=6222        /CHANGE TO INSTRUCTION FIELD 2
           6232    CIF3=6232        /CHANGE TO INSTRUCTION FIELD 3
           6242    CIF4=6242        /CHANGE TO INSTRUCTION FIELD 4
           6252    CIF5=6252        /CHANGE TO INSTRUCTION FIELD 5
           6262    CIF6=6262        /CHANGE TO INSTRUCTION FIELD 6
           6272    CIF7=6272        /CHANGE TO INSTRUCTION FIELD 7
           6203    CBFØ=6203        /CHANGE TO DATA AND INSTRUCTION FIELD Ø
           6213    CBF1=6213        /CHANGE TO DATA AND INSTRUCTION FIELD 1
           6223    CBF2=6223        /CHANGE TO DATA AND INSTRUCTION FIELD 2
           6233    CBF3=6233        /CHANGE TO DATA AND INSTRUCTION FIELD 3
           6243    CBF4=6243        /CHANGE TO DATA AND INSTRUCTION FIELD 4
           6253    CBF5=6253        /CHANGE TO DATA AND INSTRUCTION FIELD 5
           6263    CBF6=6263        /CHANGE TO DATA AND INSTRUCTION FIELD 6
           6273    CBF7=6273        /CHANGE TO DATA AND INSTRUCTION FIELD 7
           6204    CINT=6204        /CLEAR USER INTERRUPT (TIME SHARE)
           6214    RDF=6214         /READ DATA FIELD INTO AC BITS 6-8
           6224    RIF=6224         /READ INSTRUCTION FIELD INTO AC BITS 6-8
           6234    RIB=6234         /READ INTERRUPT BUFFER
                                    /AC6-8 INSTRUCTION FIELD IN USE BEFORE LAST
                                    /       PROGRAM INTERRUPT.
                                    /AC9-11 DATA FIELD IN USE BEFORE LAST
                                    /        PROGRAM INTERRUPT.
           6244    RMF=6244         /RESTORE MEMORY FIELD
                                    /INSTRUCTION FIELD LOADED FROM SAVE FIELD Ø-2
                                    /DATA FIELD LOADED FROM SAVE FIELD 3-5
           6254    SINT=6254        /SKIP ON USER INTERRUPT (TIME SHARE)
           6264    CUF=6264         /CLEAR USER FLAG (TIME SHARE)
           6274    SUF=6274         /SET USER FLAG (TIME SHARE)


           ØØ2Ø    *2Ø
                   /
                   /CONSTANTS AND POINTERS
                   /
     ØØ2Ø  4ØØØ    SWØ,     4ØØØ            /HALT AFTER ERROR
     ØØ21  2ØØØ    SW1,     2ØØØ            /INHIBIT ERROR TYPEOUT
     ØØ22  1ØØØ    SW2,     1ØØØ            /BELL ON ERROR
     ØØ23  Ø4ØØ    SW3,     4ØØ             /INHIBIT PROGRAM RELOCATION
     ØØ24  Ø2ØØ    SW4,     2ØØ             /CHANGE STACK LIMITS
     ØØ25  Ø1ØØ    SW5,     1ØØ             /HALT AFTER CURRENT TEST
     ØØ26  ØØ7Ø    SW68,    7Ø              /STARTING STACK LIMIT (Ø-7)
     ØØ27  ØØØ7    SW911,   7               /ENDING STACK LIMIT (Ø-7)
     ØØ3Ø  ØØØØ    STACKØ,  Ø               /
     ØØ31  ØØØØ    STACK1,  Ø               /
     ØØ32  ØØØØ    STACK2,  Ø               /
     ØØ33  ØØØØ    STACK3,  Ø               /STACKS CONTAIN Ø IF SELECTED FOR TESTING
     ØØ34  ØØØØ    STACK4,  Ø               /
     ØØ35  ØØØØ    STACK5,  Ø               /
     ØØ36  ØØØØ    STACK6,  Ø               /
     ØØ37  ØØØØ    STACK7,  Ø               /
     ØØ4Ø  ØØØØ    STKØ,    Ø               /
```

```
ØØ41  ØØØØ    STK1,   Ø               /
ØØ42  ØØØØ    STK2,   Ø               /
ØØ43  ØØØØ    STK3,   Ø               /Ø IF RELOCATE
ØØ44  ØØØØ    STK4,   Ø               /
ØØ45  ØØØØ    STK5,   Ø               /
ØØ46  ØØØØ    STK6,   Ø               /
ØØ47  ØØØØ    STK7,   Ø               /
ØØ5Ø  ØØØØ    NORELO, Ø               /PROG RELOCATION CONTROL (Ø=INH)
ØØ51  17Ø6    KABOVE, ABOVE           /CONTROL UPPER STACKS NOT TESTED
ØØ52  1725    KBELOW, BELOW           /CONTROL LOWER STACKS NOT TESTED
ØØ53  ØØØØ    HEAD1,  Ø               /ERROR HEADING CONTROL
ØØ54  ØØØØ    INSAME, Ø               /PROG IN SEL STACK
ØØ55  ØØØØ    LEGALØ, Ø               /LEGAL STACK SELECTION
ØØ56  ØØØØ    RUNTST, Ø               /6ØØ3=ALL, ØØØ1=1, ØØØ2=2, 2ØØØ=3, 4ØØØ=4
ØØ57  ØØØØ    TESTAD, Ø               /TEST ADDRESS COUNTER
ØØ6Ø  ØØØØ    KBINT,  Ø               /HIGHEST ACTUAL STACK IN SYSTEM
ØØ61  ØØØØ    SSL,    Ø               /STARTING STACK LIMIT ØØXØ
ØØ62  ØØØØ    ESL,    Ø               /ENDING STACK LIMIT ØØØX
ØØ63  ØØØØ    STKPIN, Ø               /STACK PROG IS IN ØØXØ
ØØ64  ØØØØ    STKTST, Ø               /STACK SEL FOR TEST ØØXØ
ØØ65  ØØØØ    BDATA,  Ø               /BAD DATA
ØØ66  ØØØØ    GDATA,  Ø               /GOOD DATA
ØØ67  ØØØØ    MOVE,   Ø               /RELOCATION ADDRESS
ØØ7Ø  1736    KDOWN,  DOWN            /CONTROL LOWER STACKS TESTED
ØØ71  ØØØØ    TEMP,   Ø               /INDIRECT ADDRESS TEMP STORAGE - CHEXM
ØØ72  ØØØØ    COUNT,  Ø               /CHECKERBOARD ERROR COUNTER
ØØ73  ØØØØ    ERRLOC, Ø               /CODERR
ØØ74  7777    M1,     -1              /CODERR - TEST 3 & 4
ØØ75  7776    M2,     -2              /MESAGE - LEGAL
ØØ76  7775    M3,     -3              /MESAGE
ØØ77  7774    M4,     -4              /MESAGE - 4 WORDS
Ø1ØØ  7744    M34,    -34             /MESAGE
Ø1Ø1  ØØØ7    K7,     7               /CODERR - ERRC - STACKS
Ø1Ø2  ØØ1Ø    K1Ø,    1Ø              /CHEXN
Ø1Ø3  ØØ2Ø    K2Ø,    2Ø              /CHEXN
Ø1Ø4  ØØ3Ø    K3Ø,    3Ø              /CHEXN
Ø1Ø5  ØØ4Ø    K4Ø,    4Ø              /CHEXN
Ø1Ø6  ØØ5Ø    K5Ø,    5Ø              /CHEXN
Ø1Ø7  ØØ6Ø    K6Ø,    6Ø              /CHEXN
Ø11Ø  ØØ7Ø    K7Ø,    7Ø              /CHEXN
Ø111  ØØ77    K77,    77              /SIXTY - MESAGE
Ø112  Ø2Ø7    K2Ø7,   2Ø7             /MESAGE - CODERR
Ø113  Ø212    K212,   212             /MESAGE
Ø114  Ø215    K215,   215             /MESAGE
Ø115  Ø24Ø    K24Ø,   24Ø             /TOSEL
Ø116  Ø245    K245,   245             /MESAGE
Ø117  Ø26Ø    K26Ø,   "Ø              /TOSEL - MAKE SEL Ø-7
Ø12Ø  Ø261    K261,   "1              /TOSEL
Ø121  Ø262    K262,   "2              /TOSEL
Ø122  Ø263    K263,   "3              /TOSEL
Ø123  Ø264    K264,   "4              /TOSEL
Ø124  Ø265    K265,   "5              /TOSEL
Ø125  Ø266    K266,   "6              /TOSEL
Ø126  Ø267    K267,   "7              /TOSEL
Ø127  Ø34Ø    K34Ø,   34Ø             /MESAGE
```

```
        Ø13Ø  Ø7Ø7    K7Ø7,   7Ø7               /SIXTY
        Ø131  4Ø6Ø    K4Ø6Ø,  4Ø6Ø              /CODERR - ERRC
        Ø132  6ØØØ    K6ØØØ,  6ØØØ              /LINK IS A Ø - PROG FIELD TYPEOUT
        Ø133  6ØØ3    K6ØØ3,  6ØØ3              /ALL TESTS
        Ø134  6Ø6Ø    K6Ø6Ø,  6Ø6Ø              /SIXTY
        Ø135  61ØØ    K61ØØ,  61ØØ              /TEST 1
        Ø136  62ØØ    K62ØØ,  62ØØ              /TEST 2
        Ø137  63ØØ    K63ØØ,  63ØØ              /TEST 3
        Ø14Ø  64ØØ    K64ØØ,  64ØØ              /TEST 4
        Ø141  62Ø1    K62Ø1,  62Ø1              /CDF Ø
        Ø142  62Ø3    K62Ø3,  62Ø3              /CBF Ø
        Ø143  2Ø42    XTYPE,  TYPE              /TYPEOUT AC ROUTINE POINTER
        Ø144  2Ø5Ø    XMESAG, MESAGE            /TTY ROUTINE POINTER
        Ø145  2ØØØ    XSIXTY, SIXTY             /SIXTY ROUTINE POINTER
        Ø146  22Ø1    XCODER, CODERR            /ERROR ROUTINE POINTER
        Ø147  22ØØ    XRETUR, RETURN            /ERROR RETURN POINTER
        Ø15Ø  2242    XSTOP,  STOP              /STOP ROUTINE POINTER
        Ø151  2241    XADDER, ADDER             /ADDRESS OF ERROR TYPEOUT POINTER
        Ø152  ØØØØ    FIVE,   Ø                 /FIVE MINUTE TIMER
        Ø153  ØØØØ    MIN5,   Ø                 /FIVE MINUTE CONTROL
        Ø154  71ØØ    MIN5Ø,  -7ØØ              /ALL TESTS FIVE MIN
        Ø155  35ØØ    MIN51,  -43ØØ             /TEST 1 FIVE MIN
        Ø156  35ØØ    MIN52,  -43ØØ             /TEST 2 FIVE MIN
        Ø157  6ØØØ    MIN53,  -2ØØØ             /TEST 3 FIVE MIN
        Ø16Ø  6ØØØ    MIN54,  -2ØØØ             /TEST 4 FIVE MIN

              ØØØØ    *Ø
        ØØØØ  ØØØØ            Ø
        ØØØ1  5ØØ1            JMP
        ØØØ2  ØØØ2            2
        ØØØ3  ØØØ3            3
              Ø2ØØ    *2ØØ
                      /
                      /KM8-E EXTENDED MEMORY ADDRESS TEST (EA8E)
                      /
        Ø2ØØ  5777'   EXTAD,  JMP     RUNØ            /ALL TESTS
        Ø2Ø1  5776'           JMP     RUN1            /TEST 1
        Ø2Ø2  5775'           JMP     RUN2            /TEST 2
        Ø2Ø3  5774'           JMP     RUN3            /TEST 3
        Ø2Ø4  5773'           JMP     RUN4            /TEST 4
        Ø2Ø5  3Ø56    EXTADØ, DCA     RUNTST          /TEST CONTROL
        Ø2Ø6  6ØØ2            IOF
        Ø2Ø7  6224            RIF
        Ø21Ø  1141            TAD     K62Ø1
        Ø211  3212            DCA     .+1
        Ø212  62Ø1            CDF Ø                   /MAKE DATA FIELD=INST FIELD
        Ø213  4772'           JMS     TITLE           /TYPEOUT PROGRAM TITLE
        Ø214  4771'   CHEXA,  JMS     SETSW           /TYPEOUT TO SETUP SWITCHES
        Ø215  724Ø            STA
        Ø216  3Ø5Ø            DCA     NORELO          /CLEAR INH RELOCATION
        Ø217  3Ø57            DCA     TESTAD          /CLEAR TEST ADDR COUNTER
        Ø22Ø  724Ø            STA
        Ø221  3Ø53            DCA     HEAD1           /RESET ERROR HEADING
        Ø222  1153            TAD     MIN5
        Ø223  3152            DCA     FIVE            /SETUP COUNTER
        Ø224  477Ø'            JMS     DOWN+2         /CLEAR STACK SELECTION CONTROLS
        Ø225  76Ø4             LAS
        Ø226  ØØ26             AND     SW68
        Ø227  3Ø61             DCA     SSL            /STARTING STACK LIMIT
        Ø23Ø  76Ø4             LAS
        Ø231  ØØ27             AND     SW911
        Ø232  3Ø62             DCA     ESL            /ENDING STACK LIMIT
        Ø233  4/67'            JMS     MSSL           /OBTAIN -SSL IN AC BITS 9-11
        Ø234  1Ø62             TAD     ESL
        Ø235  764Ø             SZA CLA                /SKIP IF SSL EQUALS ESL
        Ø236  5262             JMP     CHEXC          /CONTINUE CHECK
        Ø237  6224             RIF                    /READ INSTRUCTION FIELD
        Ø24Ø  7Ø41             CIA
        Ø241  1Ø61             TAD     SSL
        Ø242  765Ø             SNA CLA
        Ø243  5/66'            JMP     PINF           /PROGRAM IS IN THE SELECTED FIELD
        Ø244  3Ø5Ø             DCA     NORELO         /INHIBIT PROGRAM RELOCATION
        Ø245  1365             TAD     (CHEXB
        Ø246  3/64'            DCA     ABOVE-1        /STORE RETURN ADDRESS
        Ø247  1Ø62             TAD     ESL
        Ø25Ø  1Ø51             TAD     KABOVE
        Ø251  3Ø71             DCA     TEMP
        Ø252  5471             JMP I   TEMP           /INCREMENT UPPER FIELDS NOT TESTED
        Ø253  1363     CHEXB,  TAD     (CHEXE
        Ø254  3/62'            DCA     BELOW+1        /STORE RETURN ADDRESS
        Ø255  1Ø62             TAD     ESL
        Ø256  7Ø41             CIA
        Ø257  1Ø52             TAD     KBELOW
        Ø26Ø  3Ø71             DCA     TEMP
        Ø261  5471             JMP I   TEMP           /INCREMENT LOWER FIELDS NOT TESTED
        Ø262  4/67'    CHEXC,  JMS     MSSL           /OBTAIN -SSL IN AC BITS 9-11
        Ø263  1Ø62             TAD     ESL
        Ø264  771Ø             SPA CLA
        Ø265  53Ø2             JMP     CHEXD          /STARTING FIELD IS GREATER THAN ENDING FIELD
        Ø266  1361             TAD     (CHEXC1
        Ø267  3/64'            DCA     ABOVE-1        /STORE RETURN ADDRESS
        Ø27Ø  1Ø62             TAD     ESL
        Ø271  1Ø51             TAD     KABOVE
        Ø272  3Ø71             DCA     TEMP
        Ø273  5471             JMP I   TEMP           /INCREMENT UPPER FIELDS NOT TESTED
        Ø274  1363     CHEXC1, TAD     (CHEXE
        Ø275  3/62'            DCA     BELOW+1        /STORE RETURN ADDRESS
        Ø276  4/67'            JMS     MSSL           /OBTAIN -SSL IN AC BITS 9-11
        Ø277  1Ø52             TAD     KBELOW
        Ø3ØØ  3Ø71             DCA     TEMP
        Ø3Ø1  5471             JMP I   TEMP           /INCREMENT LOWER FIELDS NOT TESTED
        Ø3Ø2  136Ø     CHEXD,  TAD     (CHEXD1
        Ø3Ø3  3/62'            DCA     BELOW+1        /STORE RETURN ADDRESS
        Ø3Ø4  4/67'            JMS     MSSL           /OBTAIN -SSL IN AC BITS 9-11
        Ø3Ø5  1Ø52             TAD     KBELOW
        Ø3Ø6  3Ø71             DCA     TEMP
        Ø3Ø7  5471             JMP I   TEMP           /INCREMENT ALL LOWER FIELDS
        Ø31Ø  1363     CHEXD1, TAD     (CHEXE
        Ø311  377Ø'            DCA     DOWN+2         /STORE RETURN ADDRESS
        Ø312  1Ø62             TAD     ESL
        Ø313  7Ø41              CIA
        Ø314  1Ø7Ø              TAD     KDOWN
        Ø315  3Ø71              DCA     TEMP
        Ø316  5471              JMP I   TEMP            /RESTORE LOWER FIELDS TESTED
        Ø317  4757'   CHEXE,    JMS     HIGHST          /FIND SYSTEMS HIGHEST STACK
        Ø32Ø  1Ø6Ø              TAD     KBINT
        Ø321  1117              TAD     K26Ø
        Ø322  3Ø6Ø              DCA     KBINT           /MAKE HIGHEST STACK Ø-7 FOR TYPEOUT
        Ø323  4756'             JMS     TSTSYS          /TYPEOUT # OF STACKS IN SYSTEM
        Ø324  1355              TAD     (CHEXE2
        Ø325  3764'             DCA     ABOVE-1         /STORE RETURN ADDRESS
        Ø326  1Ø6Ø              TAD     KBINT
        Ø327  Ø1Ø1              AND     K7
        Ø33Ø  1Ø51              TAD     KABOVE
        Ø331  3Ø71              DCA     TEMP
        Ø332  5471              JMP I   TEMP            /INCREMENT UPPER STACKS NOT IN SYSTEM
        Ø355  Ø4ØØ
        Ø356  3Ø17
        Ø357  2737
        Ø36Ø  Ø31Ø
        Ø361  Ø274
        Ø362  1726
        Ø363  Ø317
        Ø364  17Ø5
        Ø365  Ø253
        Ø366  2712
        Ø367  1742
        Ø37Ø  174Ø
        Ø371  2621
        Ø372  26ØØ
        Ø373  1624
        Ø374  1617
        Ø375  1612
        Ø376  16Ø5
        Ø377  16ØØ
              Ø4ØØ              PAGE
        Ø4ØØ  4777'   CHEXE2,   JMS     TOSEL           /TYPEOUT STACK TEST SELECTION
        Ø4Ø1  421Ø              JMS     LEGAL
        Ø4Ø2  1Ø5Ø              TAD     NORELO
        Ø4Ø3  765Ø              SNA CLA
        Ø4Ø4  5276              JMP     CHEXM
        Ø4Ø5  4776'             JMS     CHKSW3          /CHECK PROG RELO SW
        Ø4Ø6  5775'             JMP     CHEXO           /RELOCATE PROGRAM
        Ø4Ø7  5327              JMP     CHEXN           /INHIBIT PROGRAM RELOCATION


                      /
                      /CHECK FOR LEGAL STACK SELECTION
                      /
        Ø41Ø  ØØØØ    LEGAL,    Ø
        Ø411  73ØØ              CLA CLL
        Ø412  3Ø54              DCA     INSAME          /CLEAR SAME CONTROL
        Ø413  1Ø75              TAD     M2
        Ø414  3Ø55              DCA     LEGALØ          /SETUP LEGAL CONTROL
        Ø415  3Ø64              DCA     STKTST
        0416  1030              TAD     STACK0
        0417  4263              JMS     LEGALA
        0420  1102              TAD     K10
        0421  3064              DCA     STKTST
        0422  1031              TAD     STACK1
        0423  4263              JMS     LEGALA
        0424  1103              TAD     K20
        0425  3064              DCA     STKTST
        0426  1032              TAD     STACK2
        0427  4263              JMS     LEGALA
        0430  1104              TAD     K30
        0431  3064              DCA     STKTST
        0432  1033              TAD     STACK3
        0433  4263              JMS     LEGALA
        0434  1105              TAD     K40
        0435  3064              DCA     STKTST
        0436  1034              TAD     STACK4
        0437  4263              JMS     LEGALA
        0440  1106              TAD     K50
        0441  3064              DCA     STKTST
        0442  1035              TAD     STACK5
        0443  4263              JMS     LEGALA
        0444  1107              TAD     K60
        0445  3064              DCA     STKTST
        0446  1036              TAD     STACK6
        0447  4263              JMS     LEGALA
        0450  1110              TAD     K70
        0451  3064              DCA     STKTST
        0452  1037              TAD     STACK7
        0453  4263              JMS     LEGALA
        0454  2055              ISZ     LEGAL0
        0455  5774'             JMP     NOSTK           /NO STACK SELECTION
        0456  1054              TAD     INSAME
        0457  7640              SZA CLA
        0460  5773'             JMP     PINF            /PROG IN SELECTED FIELD
        0461  3050              DCA     NORELO          /ONLY 1 STACK SELECTED
        0462  5610              JMP I   LEGAL
                        /
                        /LEGAL STACK SELECTION SUBROUTINE
                        /
        0463  0000      LEGALA, 0
        0464  7640              SZA CLA
        0465  5663              JMP I   LEGALA          /NOT SELECTED
        0466  2055              ISZ     LEGAL0
        0467  7410              SKP
        0470  5610              JMP I   LEGAL
        0471  6224              RIF
        0472  3063              DCA     STKPIN
        0473  4772'             JMS     SAME            /PROG IN SEL STACK
        0474  2054              ISZ     INSAME          /YES
        0475  5663              JMP I   LEGALA

                        /
                        /NO PROGRAM RELOCATION AND TEST ONLY 1 STACK
                        /
```

```
Ø476  6224   CHEXM,  RIF
Ø477  3Ø63           DCA     STKPIN          /STACK PROGRAM IS IN
Ø5ØØ  1371           TAD     (STACKØ-1
Ø5Ø1  3Ø17           DCA     17
Ø5Ø2  3Ø71           DCA     TEMP
Ø5Ø3  1417   CHEXM1, TAD I   17              /FIND STACK SEL FOR TEST
Ø5Ø4  765Ø           SNA CLA
Ø5Ø5  531Ø           JMP     CHEXM2
Ø5Ø6  2Ø71           ISZ     TEMP
Ø5Ø7  53Ø3           JMP     CHEXM1
Ø51Ø  1Ø71   CHEXM2, TAD     TEMP
Ø511  71Ø4           CLL RAL
Ø512  7ØØ6           RTL
Ø513  3Ø64           DCA     STKTST          /STACK SEL FOR TEST
Ø514  477Ø'          JMS     PNOREL          /TYPEOUT NO RELOCATION
Ø515  4767'  CHEXM3, JMS     TEST            /TEST THE SELECTED STACK
Ø516  76Ø4           LAS
Ø517  ØØ25           AND     SW5             /HALT AFTER TEST
Ø52Ø  764Ø           SZA CLA
Ø521  74Ø2           HLT
Ø522  76Ø4           LAS
Ø523  ØØ24           AND     SW4             /CHANGE STACK LIMITS?
Ø524  764Ø           SZA CLA
Ø525  5766'          JMP     CHEXA           /YES
Ø526  5315           JMP     CHEXM3          /NO


             /
             /NO PROGRAM RELOCATION BUT TEST ALL SELECTED STACKS
             /
Ø527  477Ø'  CHEXN,  JMS     PNOREL          /TYPEOUT NO RELOCATION
Ø53Ø  4765'  CHEXNØ, JMS     CHEXN1          /TEST SEL'D STACKS
Ø531  76Ø4           LAS
Ø532  ØØ25           AND     SW5             /HALT AFTER TEST
Ø533  764Ø           SZA CLA
Ø534  74Ø2           HLT
Ø535  76Ø4           LAS
Ø536  ØØ24           AND     SW4             /CHANGE STACK LIMITS?
Ø537  764Ø           SZA CLA
Ø54Ø  5766'          JMP     CHEXA           /YES
Ø541  4776'          JMS     CHKSW3          /NO
Ø542  5775'          JMP     CHEXO           /RELOCATE
Ø543  533Ø           JMP     CHEXNØ          /CONTINUE

Ø565  Ø6ØØ
Ø566  Ø214
Ø567  12ØØ
Ø57Ø  2636
Ø571  ØØ27
Ø572  1631
Ø573  2712
Ø574  2732
Ø575  1ØØØ
Ø576  164Ø
Ø577  3Ø74
```

```
        Ø6ØØ            PAGE
                /
                /TEST STACKS CONTROL
                /
Ø6ØØ  ØØØØ      CHEXN1, Ø
Ø6Ø1  72ØØ              CLA
Ø6Ø2  6224              RIF
Ø6Ø3  3Ø63              DCA     STKPIN          /STACK PROGRAM IS IN
Ø6Ø4  1Ø37              TAD     STACK7
Ø6Ø5  764Ø              SZA CLA
Ø6Ø6  5222              JMP     CHEXN2
Ø6Ø7  111Ø              TAD     K7Ø
Ø61Ø  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
Ø611  3Ø72              DCA     COUNT
Ø612  4777'             JMS     SAME            /PROG IN SEL STACK?
Ø613  5222              JMP     CHEXN2          /YES
Ø614  4776'             JMS     TEST            /NO - TEST THE SEL STACK
Ø615  1Ø72              TAD     COUNT
Ø616  764Ø              SZA CLA
Ø617  2Ø47              ISZ     STK7
Ø62Ø  741Ø              SKP
Ø621  5217              JMP     .-2
Ø622  1Ø36      CHEXN2, TAD     STACK6
Ø623  764Ø              SZA CLA
Ø624  524Ø              JMP     CHEXN3
Ø625  11Ø7              TAD     K6Ø
Ø626  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
Ø627  3Ø72              DCA     COUNT
Ø63Ø  4777'             JMS     SAME            /PROG IN SEL STACK?
Ø631  524Ø              JMP     CHEXN3          /YES
Ø632  4776'             JMS     TEST            /NO - TEST THE SEL STACK
Ø633  1Ø72              TAD     COUNT
Ø634  764Ø              SZA CLA
Ø635  2Ø46              ISZ     STK6
Ø636  741Ø              SKP
Ø637  5235              JMP     .-2
Ø64Ø  1Ø35      CHEXN3, TAD     STACK5
Ø641  764Ø              SZA CLA
Ø642  5256              JMP     CHEXN4
Ø643  11Ø6              TAD     K5Ø
Ø644  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
Ø645  3Ø72              DCA     COUNT
Ø646  4777'             JMS     SAME            /PROG IN SEL STACK?
Ø647  5256              JMP     CHEXN4          /YES
Ø65Ø  4776'             JMS     TEST            /NO - TEST THE SEL STACK
Ø651  1Ø72              TAD     COUNT
Ø652  764Ø              SZA CLA
Ø653  2Ø45              ISZ     STK5
Ø654  741Ø              SKP
Ø655  5253              JMP     .-2
Ø656  1Ø34      CHEXN4, TAD     STACK4
Ø657  764Ø              SZA CLA
Ø66Ø  5274              JMP     CHEXN5
Ø661  11Ø5              TAD     K4Ø
Ø662  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
```

```
0663  3072            DCA     COUNT
0664  4777'           JMS     SAME            /PROG IN SEL STACK?
0665  5274            JMP     CHEXN5          /YES
0666  4776'           JMS     TEST            /NO - TEST THE SEL STACK
0667  1072            TAD     COUNT
0670  7640            SZA CLA
0671  2044            ISZ     STK4
0672  7410            SKP
0673  5271            JMP     .-2
0674  1033    CHEXN5, TAD     STACK3
0675  7640            SZA CLA
0676  5312            JMP     CHEXN6
0677  1104            TAD     K30
0700  3064            DCA     STKTST          /STACK SEL FOR TEST
0701  3072            DCA     COUNT
0702  4777'           JMS     SAME            /PROG IN SEL STACK?
0703  5312            JMP     CHEXN6          /YES
0704  4776'           JMS     TEST            /NO - TEST THE SEL STACK
0705  1072            TAD     COUNT
0706  7640            SZA CLA
0707  2043            ISZ     STK3
0710  7410            SKP
0711  5307            JMP     .-2
0712  1032    CHEXN6, TAD     STACK2
0713  7640            SZA CLA
0714  5330            JMP     CHEXN7
0715  1103            TAD     K20
0716  3064            DCA     STKTST          /STACK SEL FOR TEST
0717  3072            DCA     COUNT
0720  4777'           JMS     SAME            /PROG IN SEL STACK?
0721  5330            JMP     CHEXN7          /YES
0722  4776'           JMS     TEST            /NO - TEST THE SEL STACK
0723  1072            TAD     COUNT
0724  7640            SZA CLA
0725  2042            ISZ     STK2
0726  7410            SKP
0727  5325            JMP     .-2
0730  1031    CHEXN7, TAD     STACK1
0731  7640            SZA CLA
0732  5346            JMP     CHEXN8
0733  1102            TAD     K10
0734  3064            DCA     STKTST          /STACK SEL FOR TEST
0735  3072            DCA     COUNT
0736  4777'           JMS     SAME            /PROG IN SEL STACK?
0737  5346            JMP     CHEXN8          /YES
0740  4776'           JMS     TEST            /NO - TEST THE SEL STACK
0741  1072            TAD     COUNT
0742  7640            SZA CLA
0743  2041            ISZ     STK1
0744  7410            SKP
0745  5343            JMP     .-2
0746  1030    CHEXN8, TAD     STACK0
0747  7640            SZA CLA
0750  5361            JMP     CHEXN9
0751  3064            DCA     STKTST          /STACK SEL FOR TEST
```

```
0752  3072            DCA     COUNT
0753  4777'           JMS     SAME          /PROG IN SEL STACK?
0754  5361            JMP     CHEXN9        /YES
0755  4776'           JMS     TEST          /NO - TEST THE SEL STACK
0756  1072            TAD     COUNT
0757  7640            SZA CLA
0760  2040            ISZ     STK0
0761  5600   CHEXN9,  JMP I   CHEXN1
0762  5360            JMP     .-2

0776  1200
0777  1631
      1000            PAGE


             /
             /CHECK ALL SELECTED STACKS FROM EACH SELECTED STACK
             /
1000  4777'  CHEXO,   JMS     PREL          /TYPEOUT RELOCATION
1001  4776'           JMS     RESTK         /RESTORE STK(S)
1002  4775'           JMS     CHEXN1        /TEST FROM PRESENT STACK
1003  4774'           JMS     CHKSW3
1004  7410            SKP
1005  5773'           JMP     CHEXN
1006  6224   CHEXOA,  RIF
1007  3063            DCA     STKPIN        /STACK PROGRAM IS IN
1010  1047            TAD     STK7
1011  7640            SZA CLA
1012  5224            JMP     CHEXO0
1013  1110            TAD     K70
1014  3064            DCA     STKTST        /STACK SEL FOR MOVE TO
1015  4772'           JMS     SAME          /PROG IN MOVE STACK?
1016  7410            SKP                   /YES
1017  4771'           JMS     RELO          /NO - RELOCATE PROGRAM
1020  4775'           JMS     CHEXN1        /TEST ALL SEL STACKS
1021  4774'           JMS     CHKSW3
1022  7410            SKP
1023  5773'           JMP     CHEXN
1024  1046   CHEXO0,  TAD     STK6
1025  7640            SZA CLA
1026  5240            JMP     CHEXO1
1027  1107            TAD     K60
1030  3064            DCA     STKTST        /STACK SEL FOR MOVE TO
1031  4772'           JMS     SAME          /PROG IN MOVE STACK?
1032  7410            SKP                   /YES
1033  4771'           JMS     RELO          /NO - RELOCATE PROGRAM
1034  4775'           JMS     CHEXN1        /TEST ALL SEL STACKS
1035  4774'           JMS     CHKSW3
1036  7410            SKP
1037  5773'           JMP     CHEXN
1040  1045   CHEXO1,  TAD     STK5
1041  7640            SZA CLA
1042  5254            JMP     CHEXO2
1043  1106            TAD     K50
1044  3064            DCA     STKTST
```

```
1Ø45  4772'           JMS     SAME
1Ø46  741Ø            SKP
1Ø47  4771'           JMS     RELO
1Ø5Ø  4775'           JMS     CHEXN1
1Ø51  4774'           JMS     CHKSW3
1Ø52  741Ø            SKP
1Ø53  5773'           JMP     CHEXN
1Ø54  1Ø44  CHEXO2,   TAD     STK4
1Ø55  764Ø            SZA CLA
1Ø56  527Ø            JMP     CHEXO3
1Ø57  11Ø5            TAD     K4Ø
1Ø6Ø  3Ø64            DCA     STKTST
1Ø61  4772'           JMS     SAME
1Ø62  741Ø            SKP
1Ø63  4771'           JMS     RELO
1Ø64  4775'           JMS     CHEXN1
1Ø65  4774'           JMS     CHKSW3
1Ø66  741Ø            SKP
1Ø67  5773'           JMP   . CHEXN
1Ø7Ø  1Ø43  CHEXO3,   TAD     STK3
1Ø71  764Ø            SZA CLA
1Ø72  53Ø4            JMP     CHEXO4
1Ø73  11Ø4            TAD     K3Ø
1Ø74  3Ø64            DCA     STKTST
1Ø75  4772'           JMS     SAME
1Ø76  741Ø            SKP
1Ø77  4771'           JMS     RELO
11ØØ  4775'           JMS     CHEXN1
11Ø1  4774'           JMS     CHKSW3
11Ø2  741Ø            SKP
11Ø3  5773'           JMP     CHEXN
11Ø4  1Ø42  CHEXO4,   TAD     STK2
11Ø5  764Ø            SZA CLA
11Ø6  532Ø            JMP     CHEXO5
11Ø7  11Ø3            TAD     K2Ø
111Ø  3Ø64            DCA     STKTST
1111  4772'           JMS     SAME
1112  741Ø            SKP
1113  4771'           JMS     RELO
1114  4775'           JMS     CHEXN1
1115  4774'           JMS     CHKSW3
1116  741Ø            SKP
1117  5773'           JMP     CHEXN
112Ø  1Ø41  CHEXO5,   TAD     STK1
1121  764Ø            SZA CLA
1122  5334            JMP     CHEXO6
1123  11Ø2            TAD     K1Ø
1124  3Ø64            DCA     STKTST
1125  4772'           JMS     SAME
1126  741Ø            SKP
1127  4771'           JMS     RELO
113Ø  4775'           JMS     CHEXN1
1131  4774'           JMS     CHKSW3
1132  741Ø            SKP
1133  5773'           JMP     CHEXN
```

```
        1134  1Ø4Ø    CHEXO6, TAD     STKØ
        1135  764Ø            SZA CLA
        1136  5344            JMP     CHEXO7
        1137  3Ø64            DCA     STKTST
        114Ø  4772'           JMS     SAME
        1141  741Ø            SKP
        1142  4771'           JMS     RELO
        1143  4775'           JMS     CHEXN1
        1144  76Ø4    CHEXO7, LAS
        1145  ØØ25            AND     SW5             /HALT AFTER TEST
        1146  764Ø            SZA CLA
        1147  74Ø2            HLT
        115Ø  76Ø4            LAS
        1151  ØØ24            AND     SW4             /CHANGE STACK LIMITS?
        1152  764Ø            SZA CLA
        1153  577Ø'           JMP     CHEXA           /YES
        1154  4774'           JMS     CHKSW3          /NO
        1155  52Ø6            JMP     CHEXOA          /RELOCATE THE PROGRAM
        1156  5773'           JMP     CHEXN           /INHIBIT PROGRAM RELOCATION

        117Ø  Ø214
        1171  1646
        1172  1631
        1173  Ø527
        1174  164Ø
        1175  Ø6ØØ
        1176  3Ø51
        1177  2672
              12ØØ            PAGE


                      /
                      /RUN THE SELECTED TEST(S) ON THE SELECTED FIELD (STKTST)
                      /
        12ØØ  ØØØØ    TEST,   Ø
        12Ø1  73ØØ            CLA CLL
        12Ø2  1Ø64            TAD     STKTST          /UPDATE CDF TEST DATA FIELDS
        12Ø3  1141            TAD     K62Ø1
        12Ø4  3252            DCA     TDF1
        12Ø5  1252            TAD     TDF1
        12Ø6  3777'           DCA     TDF2
        12Ø7  1777'           TAD     TDF2
        121Ø  3776'           DCA     TDF3
        1211  1776'           TAD     TDF3
        1212  3775'           DCA     TDF4
        1213  3Ø72            DCA     COUNT           /CLEAR ERROR COUNT
        1214  1Ø56            TAD     RUNTST
        1215  7Ø1Ø            RAR
        1216  763Ø            SZL CLA
        1217  425Ø            JMS     TEST1           /EXECUTE TEST 1
        122Ø  1Ø56            TAD     RUNTST
        1221  7Ø12            RTR
        1222  763Ø            SZL CLA
        1223  4774'           JMS     TEST2           /EXECUTE TEST 2
        1224  1Ø56            TAD     RUNTST
        1225  7ØØ6            RTL
        1226  763Ø            SZL CLA
        1227  4773'           JMS     TEST3           /EXECUTE TEST 3
        123Ø  1Ø56            TAD     RUNTST
        1231  7ØØ4            RAL
        1232  763Ø            SZL CLA
        1233  4772'           JMS     TEST4           /EXECUTE TEST 4
        1234  76Ø4            LAS
        1235  ØØ24            AND     SW4             /CHANGE STACK LIMITS?
        1236  764Ø            SZA CLA
        1237  5771'           JMP     CHEXA           /YES
        124Ø  2152            ISZ     FIVE
        1241  56ØØ            JMP I   TEST            /NOT 5 MINUTES YET
        1242  1153            TAD     MIN5
        1243  3152            DCA     FIVE            /RESTORE TIMER
        1244  4544            JMS I   XMESAG
        1245  4543            4543
        1246  65ØØ            65ØØ
        1247  56ØØ            JMP I   TEST


                    /TEST 1
                    /
                    /WRITE THE VALUE OF EACH LOCATION INTO ITSELF AND CHECK
                    /
        125Ø  ØØØØ  TEST1,  Ø
        1251  3Ø57          DCA     TESTAD          /CLEAR TEST ADDRESS COUNTER
        1252  62Ø1  TDF1,   CDFØ                    /CHANGE TO TEST DATA FIELD
        1253  1Ø57  TEST1A, TAD     TESTAD
        1254  3457          DCA I   TESTAD          /WRITE MEMORY
        1255  2Ø57          ISZ     TESTAD
        1256  5253          JMP     TEST1A          /4Ø96 TIMES
        1257  1Ø57  TEST1B, TAD     TESTAD          /READ AND CHECK
        126Ø  7Ø41          CIA
        1261  1457          TAD I   TESTAD
        1262  764Ø          SZA CLA
        1263  5273          JMP     ADDER1          /ADDRESS ERROR
        1264  2Ø57  ADDRT1, ISZ     TESTAD
        1265  5257          JMP     TEST1B          /CONTINUE READ AND CHECK
        1266  1Ø63          TAD     STKPIN
        1267  1141          TAD     K62Ø1
        127Ø  3271          DCA     .+1
        1271  62Ø1          CDFØ                    /CHANGE TO PROGRAM DATA FIELD
        1272  565Ø          JMP I   TEST1           /DONE

        1273  1Ø57  ADDER1, TAD     TESTAD
        1274  3Ø66          DCA     GDATA           /GOOD
        1275  1457          TAD I   TESTAD
        1276  3Ø65          DCA     BDATA           /BAD
        1277  1Ø63          TAD     STKPIN
        13ØØ  1141          TAD     K62Ø1
        13Ø1  33Ø2          DCA     .+1
        13Ø2  62Ø1          CDFØ                    /CHANGE TO PROGRAM DATA FIELD
        13Ø3  477Ø'         JMS     ERR1            /ADDRESS ERROR TEST1
        13Ø4  1Ø64          TAD     STKTST
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      1305  1141          TAD     K62Ø1
      13Ø6  33Ø7          DCA     .+1
      13Ø7  62Ø1          CDFØ                    /CHANGE TO TEST DATA FIELD
      131Ø  5264          JMP     ADDRT1

      137Ø  2256
      1371  Ø214
      1372  1514
      1373  1443
      1374  14ØØ
      1375  1516
      1376  1445
      1377  14Ø2
            14ØØ          PAGE

                  /TEST 2
                  /
                  /WRITE THE COMPLEMENT VALUE OF EACH LOCATION INTO ITSELF AND CHECK
                  /
      14ØØ  ØØØØ  TEST2,  Ø
      14Ø1  3Ø57          DCA     TESTAD          /CLEAR TEST ADDRESS COUNTER
      14Ø2  62Ø1  TDF2,   CDFØ                    /CHANGE TO TEST DATA FIELD
      14Ø3  1Ø57  TEST2A, TAD     TESTAD
      14Ø4  7Ø4Ø          CMA
      14Ø5  3457          DCA I   TESTAD          /WRITE MEMORY
      14Ø6  2Ø57          ISZ     TESTAD
      14Ø7  52Ø3          JMP     TEST2A          /4Ø96 TIMES
      141Ø  1Ø57  TEST2B, TAD     TESTAD          /READ AND CHECK
      1411  7ØØ1          IAC
      1412  1457          TAD I   TESTAD
      1413  764Ø          SZA CLA
      1414  5224          JMP     ADDER2          /ADDRESS ERROR
      1415  2Ø57  ADDRT2, ISZ     TESTAD
      1416  521Ø          JMP     TEST2B          /CONTINUE READ AND CHECK
      1417  1Ø63          TAD     STKPIN
      142Ø  1141          TAD     K62Ø1
      1421  3222          DCA     .+1
      1422  62Ø1          CDFØ                    /CHANGE TO PROGRAM DATA FIELD
      1423  56ØØ          JMP I   TEST2           /DONE

      1424  1Ø57  ADDER2, TAD     TESTAD
      1425  7Ø4Ø          CMA
      1426  3Ø66          DCA     GDATA           /GOOD
      1427  1457          TAD I   TESTAD
      143Ø  3Ø65          DCA     BDATA           /BAD
      1431  1Ø63          TAD     STKPIN
      1432  1141          TAD     K62Ø1
      1433  3234          DCA     .+1
      1434  62Ø1          CDFØ                    /CHANGE TO PROGRAM DATA FIELD
      1435  4777'         JMS     ERR2            /ADDRESS ERROR TEST 2
      1436  1Ø64          TAD     STKTST
      1437  1141          TAD     K62Ø1
      144Ø  3241          DCA     .+1
      1441  62Ø1          CDFØ                    /CHANGE TO TEST DATA FIELD
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1442  5215          JMP     ADDRT2

              /TEST 3
              /
              /WRITE THE VALUE OF EACH LOCATION INTO ITSELF AND CHECK BACKWARDS
              /
1443  0000    TEST3,  0
1444  3057            DCA     TESTAD          /CLEAR TEST ADDRESS COUNTER
1445  6201    TDF3,   CDF0                    /CHANGE TO TEST DATA FIELD
1446  1057    TEST3A, TAD     TESTAD
1447  1074            TAD     M1
1450  3057            DCA     TESTAD
1451  1057            TAD     TESTAD
1452  3457            DCA I   TESTAD          /WRITE MEMORY
1453  1057            TAD     TESTAD
1454  7640            SZA CLA
1455  5246            JMP     TEST3A          /4096 TIMES
1456  1057    TEST3B, TAD     TESTAD
1457  1074            TAD     M1
1460  3057            DCA     TESTAD
1461  1057            TAD     TESTAD          /READ AND CHECK
1462  7041            CIA
1463  1457            TAD I   TESTAD
1464  7640            SZA CLA
1465  5276            JMP     ADDER3          /ADDRESS ERROR
1466  1057    ADDRT3, TAD     TESTAD
1467  7640            SZA CLA
1470  5256            JMP     TEST3B          /CONTINUE READ AND CHECK
1471  1063            TAD     STKPIN
1472  1141            TAD     K6201
1473  3274            DCA     .+1
1474  6201            CDF0                    /CHANGE TO PROGRAM DATA FIELD
1475  5643            JMP I   TEST3           /DONE

1476  1057    ADDER3, TAD     TESTAD
1477  3066            DCA     GDATA           /GOOD
1500  1457            TAD I   TESTAD
1501  3065            DCA     BDATA           /BAD
1502  1063            TAD     STKPIN
1503  1141            TAD     K6201
1504  3305            DCA     .+1
1505  6201            CDF0                    /CHANGE TO PROGRAM DATA FIELD
1506  4776'           JMS     ERR3            /ADDRESS ERROR TEST 3
1507  1064            TAD     STKTST
1510  1141            TAD     K6201
1511  3312            DCA     .+1
1512  6201            CDF0                    /CHANGE TO TEST DATA FIELD
1513  5266            JMP     ADDRT3
              /TEST 4
              /
              /WRITE THE COMPLEMENT VALUE OF EACH LOCATION INTO ITSELF
              /AND CHECK BACKWARDS
              /
1514  0000    TEST4,  0
1515  3057            DCA     TESTAD          /CLEAR TEST ADDRESS COUNTER
```

```
1516  62Ø1     TDF4,   CDFØ                  /CHANGE TO TEST DATA FIELD
1517  1Ø57     TEST4A, TAD     TESTAD
152Ø  1Ø74             TAD     M1
1521  3Ø57             DCA     TESTAD
1522  1Ø57             TAD     TESTAD
1523  7Ø4Ø             CMA
1524  3457             DCA I   TESTAD        /WRITE MEMORY
1525  1Ø57             TAD     TESTAD
1526  764Ø             SZA CLA
1527  5317             JMP     TEST4A        /4Ø96 TIMES
153Ø  1Ø57     TEST4B, TAD     TESTAD
1531  1Ø74             TAD     M1
1532  3Ø57             DCA     TESTAD
1533  1Ø57             TAD     TESTAD        /READ AND CHECK
1534  7ØØ1             IAC
1535  1457             TAD I   TESTAD
1536  764Ø             SZA CLA
1537  535Ø             JMP     ADDER4        /ADDRESS ERROR
154Ø  1Ø57     ADDRT4, TAD     TESTAD
1541  764Ø             SZA CLA
1542  533Ø             JMP     TEST4B        /CONTINUE READ AND CHECK
1543  1Ø63             TAD     STKPIN
1544  1141             TAD     K62Ø1
1545  3346             DCA     .+1
1546  62Ø1             CDFØ                  /CHANGE TO PROGRAM DATA FIELD
1547  5714             JMP I   TEST4         /DONE

155Ø  1Ø57     ADDER4, TAD     TESTAD
1551  7Ø4Ø             CMA
1552  3Ø66             DCA     GDATA         /GOOD
1553  1457             TAD I   TESTAD
1554  3Ø65             DCA     BDATA         /BAD
1555  1Ø63             TAD     STKPIN
1556  1141             TAD     K62Ø1
1557  336Ø             DCA     .+1
156Ø  62Ø1             CDFØ                  /CHANGE TO PROGRAM DATA FIELD
1561  4775'            JMS     ERR4          /ADDRESS ERROR TEST 4
1562  1Ø64             TAD     STKTST
1563  1141             TAD     K62Ø1
1564  3365             DCA     .+1
1565  62Ø1             CDFØ                  /CHANGE TO TEST DATA FIELD
1566  534Ø             JMP     ADDRT4

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1576  24ØØ
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      16ØØ             PAGE


               /
               /SETUP 5 MINUTE TIMER & TEST SELECTED TO RUN
               /
16ØØ  72ØØ     RUNØ,   CLA                   /RUN ALL TESTS
16Ø1  1154             TAD     MIN5Ø
16Ø2  3153             DCA     MIN5
```

```
        1603  1133              TAD     K6ØØ3
        1604  5777'             JMP     EXTADØ
        1605  72ØØ      RUN1,   CLA                     /RUN ONLY TEST 1
        1606  1155              TAD     MIN51
        1607  3153              DCA     MIN5
        161Ø  7ØØ1              IAC
        1611  5777'             JMP     EXTADØ
        1612  73ØØ      RUN2,   CLA CLL                 /RUN ONLY TEST 2
        1613  1156              TAD     MIN52
        1614  3153              DCA     MIN5
        1615  7ØØ5              IAC RAL
        1616  5777'             JMP     EXTADØ
        1617  72ØØ      RUN3,   CLA                     /RUN ONLY TEST 3
        162Ø  1157              TAD     MIN53
        1621  3153              DCA     MIN5
        1622  7132              STL RTR
        1623  5777'             JMP     EXTADØ
        1624  72ØØ      RUN4,   CLA                     /RUN ONLY TEST 4
        1625  116Ø              TAD     MIN54
        1626  3153              DCA     MIN5
        1627  713Ø              STL RAR
        163Ø  5777'             JMP     EXTADØ

                        /
                        /RETURN IF PROGRAM IS IN SELECTED STACK
                        /RETURN+1 IF PROGRAM IS NOT IN SELECTED STACK
                        /
        1631  ØØØØ      SAME,   Ø
        1632  1Ø63              TAD     STKPIN
        1633  7Ø41              CIA
        1634  1Ø64              TAD     STKTST
        1635  764Ø              SZA CLA
        1636  2231              ISZ     SAME            /PROG NOT IN SEL STACK
        1637  5631              JMP I   SAME
                        /
                        /CHECK PROGRAM RELOCATION SWITCH
                        /RETURN IF RELOCATE, RETURN+1 IF INHIBIT RELOCATION
                        /
        164Ø  ØØØØ      CHKSW3, Ø
        1641  76Ø4              LAS
        1642  ØØ23              AND     SW3
        1643  764Ø              SZA CLA
        1644  224Ø              ISZ     CHKSW3          /INHIBIT RELOCATION
        1645  564Ø              JMP I   CHKSW3
                        /
                        /RELOCATE THE PROGRAM
                        /
        1646  ØØØØ      RELO,   Ø
        1647  72ØØ              CLA
        165Ø  3Ø72              DCA     COUNT           /CLEAR ERROR COUNTER
        1651  3Ø67              DCA     MOVE
        1652  1141              TAD     K62Ø1
        1653  1Ø63              TAD     STKPIN
        1654  3265              DCA     RELO2
        1655  1141              TAD     K62Ø1
```

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1656  1Ø64            TAD     STKTST
1657  3267            DCA     RELO3
166Ø  1265            TAD     RELO2
1661  3272            DCA     RELO4
1662  1142            TAD     K62Ø3
1663  1Ø64            TAD     STKTST
1664  33Ø3            DCA     RELO5
1665  62Ø1    RELO2,  CDFØ                    /MOVE FROM DATA FIELD
1666  1467            TAD I   MOVE
1667  62Ø1    RELO3,  CDFØ                    /MOVE TO DATA FIELD
167Ø  3467            DCA I   MOVE
1671  1467            TAD I   MOVE
1672  62Ø1    RELO4,  CDFØ                    /MOVE FROM DATA FIELD
1673  7Ø41            CIA
1674  1467            TAD I   MOVE
1675  764Ø            SZA CLA
1676  4776'           JMS     ERRM            /MOVE ERROR
1677  2Ø67            ISZ     MOVE
17ØØ  5265            JMP     RELO2
17Ø1  1Ø72            TAD     COUNT
17Ø2  765Ø            SNA CLA                 /SKIP IF MOVE ERROR
17Ø3  62Ø3    RELO5,  CBFØ                    /CHANGE TO NEW PROG FIELD
17Ø4  5646            JMP I   RELO
              /
              /INCREMENT CONTROL OF UPPER STACKS NOT TESTED AND/OR
              /STACKS NOT IN THE SYSTEM
              /
17Ø5  ØØØØ            Ø                       /RETURN ADDRESS
17Ø6  2Ø31    ABOVE,  ISZ     STACK1
17Ø7  2Ø32            ISZ     STACK2
171Ø  2Ø33            ISZ     STACK3
1711  2Ø34            ISZ     STACK4
1712  2Ø35            ISZ     STACK5
1713  2Ø36            ISZ     STACK6
1714  2Ø37            ISZ     STACK7
1715  57Ø5            JMP I   ABOVE-1

              /
              /INCREMENT CONTROL OF LOWER STACKS NOT TESTED
              /
1716  2Ø36            ISZ     STACK6
1717  2Ø35            ISZ     STACK5
172Ø  2Ø34            ISZ     STACK4
1721  2Ø33            ISZ     STACK3
1722  2Ø32            ISZ     STACK2
1723  2Ø31            ISZ     STACK1
1724  2Ø3Ø            ISZ     STACKØ
1725  5726    BELOW,  JMP I   .+1
1726  ØØØØ            Ø
              /
              /CLEAR ALL STACKS OR STACKS TO BE TESTED
              /
1727  3Ø37            DCA     STACK7
173Ø  3Ø36            DCA     STACK6
1731  3Ø35            DCA     STACK5
```

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1732  3Ø34           DCA     STACK4
1733  3Ø33           DCA     STACK3
1734  3Ø32           DCA     STACK2
1735  3Ø31           DCA     STACK1
1736  3Ø3Ø   DOWN,   DCA     STACKØ
1737  574Ø           JMP I   .+1
174Ø  ØØØØ           Ø                   /RETURN ADDRESS
1741  5327           JMP     .-12        /CLEAR ALL STACK SELECTION CONTROLS
             /
             /OBTAIN -SSL (MINUS STARTING STACK LIMIT)
             /
1742  ØØØØ   MSSL,   Ø
1743  1Ø61           TAD     SSL
1744  7112           CLL RTR
1745  7Ø1Ø           RAR
1746  7Ø41           CIA
1747  5742           JMP I   MSSL

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1777  Ø2Ø5
      2ØØØ           PAGE

             /
             /CONVERT OCTAL NUMBERS FOR TYPEOUT
             /
2ØØØ  ØØØØ   SIXTY,  Ø
2ØØ1  73ØØ           CLA CLL
2ØØ2  16ØØ           TAD I   SIXTY       /GET ADDRESS OF OPERAND
2ØØ3  3237           DCA     SIXTYØ
2ØØ4  22ØØ           ISZ     SIXTY
2ØØ5  16ØØ           TAD I   SIXTY       /GET STORAGE ADDRESS
2ØØ6  324Ø           DCA     SIXTY1
2ØØ7  22ØØ           ISZ     SIXTY       /CORRECT RETURN ADDRESS
2Ø1Ø  1111           TAD     K77
2Ø11  7Ø4Ø           CMA                 /AC=77ØØ
2Ø12  Ø637           AND I   SIXTYØ      /AND OPERAND FIRST 2 DIGITS
2Ø13  7112           CLL RTR
2Ø14  7Ø12           RTR
2Ø15  7Ø12           RTR                 /POSITION FIRST 2 DIGITS
2Ø16  4224           JMS     CNV         /CONVERT DIGITS FOR TYPEOUT
2Ø17  224Ø           ISZ     SIXTY1      /INCREMENT STORAGE ADDRESS
2Ø2Ø  1111           TAD     K77
2Ø21  Ø637           AND I   SIXTYØ      /AND OPERAND SECOND 2 DIGITS
2Ø22  4224           JMS     CNV         /CONVERT DIGITS FOR TYPEOUT
2Ø23  56ØØ           JMP I   SIXTY
2Ø24  ØØØØ   CNV,    Ø
2Ø25  3241           DCA     SIXTY2      /SAVE DIGITS
2Ø26  1241           TAD     SIXTY2
2Ø27  71Ø6           CLL RTL
2Ø3Ø  7ØØ4           RAL
2Ø31  Ø13Ø           AND     K7Ø7        /AND LEFT DIGIT
2Ø32  1241           TAD     SIXTY2
2Ø33  Ø13Ø           AND     K7Ø7        /AND RIGHT DIGIT
2Ø34  1134           TAD     K6Ø6Ø
2Ø35  364Ø           DCA I   SIXTY1      /STORE CONVERTED DIGITS
```

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        2036  5624              JMP I   CNV

        2037  ØØØØ      SIXTYØ, Ø                       /ADDRESS OF OPERAND
        2040  ØØØØ      SIXTY1, Ø                       /STORAGE ADDRESS
        2041  ØØØØ      SIXTY2, Ø                       /TEMPORARY STORAGE

                        /
                        /TYPEOUT CHARACTER IN AC AND RETURN
                        /
        2042  ØØØØ      TYPE,   Ø
        2043  6Ø46              TLS                     /TRANSMIT CHARACTER
        2044  6Ø41              TSF
        2045  5244              JMP     .-1             /WAIT FOR FLAG
        2046  73ØØ              CLA CLL
        2047  5642              JMP I   TYPE

                        /
                        /TELETYPE OUTPUT ROUTINE WITH BELL
                        /
        2Ø5Ø  ØØØØ      MESAGE, Ø
        2Ø51  724Ø              STA
        2Ø52  125Ø              TAD     MESAGE          /FIRST WORD -1
        2Ø53  3Ø1Ø              DCA     1Ø
        2Ø54  141Ø              TAD I   1Ø
        2Ø55  3266              DCA     MSRGHT
        2Ø56  1266              TAD     MSRGHT
        2Ø57  7112              CLL RTR
        2Ø6Ø  7Ø12              RTR
        2Ø61  7Ø12              RTR                     /POSITION FIRST CHARACTER
        2Ø62  4267              JMS     TYPECH          /TYPEOUT FIRST CHARACTER
        2Ø63  1266              TAD     MSRGHT
        2Ø64  4267              JMS     TYPECH          /TYPEOUT SECOND CHARACTER
        2Ø65  5254              JMP     MESAGE+4        /CONTINUE TYPING
        2Ø66  ØØØØ      MSRGHT, Ø
        2Ø67  ØØØØ      TYPECH, Ø
        2Ø7Ø  Ø111              AND     K77
        2Ø71  745Ø              SNA                     /IS IT END OF MESSAGE?
        2Ø72  541Ø              JMP I   1Ø              /RETURN TO PROGRAM
        2Ø73  11ØØ              TAD     M34             /SUBTRACT 34
        2Ø74  744Ø              SZA
        2Ø75  53ØØ              JMP     .+3
        2Ø76  1112              TAD     K2Ø7            /CODE IS BELL
        2Ø77  532Ø              JMP     MTP
        21ØØ  1Ø77              TAD     M4              /SUBTRACT 4
        21Ø1  75ØØ              SMA                     /CODE LESS THAN 4Ø?
        21Ø2  53Ø5              JMP     .+3             /NO
        21Ø3  1127              TAD     K34Ø            /YES, ADD 3ØØ, CODE IS ALPHA
        21Ø4  532Ø              JMP     MTP
        21Ø5  1Ø76              TAD     M3              /SUBTRACT 3
        21Ø6  744Ø              SZA
        21Ø7  5312              JMP     .+3
        211Ø  1113              TAD     K212            /CODE IS LINE FEED
        2111  532Ø              JMP     MTP
        2112  1Ø75              TAD     M2              /SUBTRACT 2
        2113  744Ø              SZA
```

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2114  5317              JMP     .+3
2115  1114              TAD     K215            /CODE IS CR
2116  741Ø              SKP
2117  1116              TAD     K245            /ADD 2ØØ TO OTHER CODES >4Ø
212Ø  4242      MTP,    JMS     TYPE            /TYPEOUT CHARACTER IN AC
2121  5667              JMP I   TYPECH
      22ØØ              PAGE

                /
                /ERROR ROUTINE (BELL ON ERROR HAS PRIORITY)
                /
22ØØ  ØØØØ      RETURN, Ø                       /PROGRAM RETURN ADDRESS
22Ø1  6ØØ2      CODERR, IOF
22Ø2  76Ø4              LAS                     /CHECK FOR BELL ON ERROR
22Ø3  ØØ22              AND     SW2
22Ø4  765Ø              SNA CLA
22Ø5  5211              JMP     .+4

22Ø6  1112      RBELL,  TAD     K2Ø7            /BELL CODE
22Ø7  4543              JMS I   XTYPE           /RING BELL
221Ø  56ØØ              JMP I   RETURN
2211  76Ø4              LAS                     /CHECK FOR INHIBIT TYPEOUT
2212  ØØ21              AND     SW1
2213  764Ø              SZA CLA
2214  5242              JMP     STOP            /INHIBIT TYPEOUT
2215  6224              RIF                     /READ INST FIELD
2216  7Ø12              RTR
2217  7Ø1Ø              RAR
222Ø  Ø1Ø1              AND     K7
2221  1131              TAD     K4Ø6Ø
2222  3233              DCA     ERRORØ
2223  12ØØ              TAD     RETURN
2224  1Ø74              TAD     M1
2225  3Ø73              DCA     ERRLOC
2226  4545              JMS I   XSIXTY
2227  ØØ73              ERRLOC
223Ø  2234              ERROR1
2231  4544              JMS I   XMESAG          /TYPEOUT ERROR LOCATION
2232  4543              4543
2233  ØØØØ      ERRORØ, Ø                       /FIELD
2234  ØØØØ      ERROR1, Ø
2235  ØØØØ              Ø                       /PROGRAM LOCATION OF ERROR JMS
2236  4Ø4Ø              4Ø4Ø
2237  ØØØØ              ØØØØ
224Ø  5641              JMP I   .+1             /TYPEOUT ERROR
2241  ØØØØ      ADDER,  Ø                       /ADDRESS OF ERROR TYPEOUT
2242  76Ø4      STOP,   LAS                     /HALT AFTER ERROR
2243  ØØ2Ø              AND     SWØ
2244  765Ø              SNA CLA
2245  5251              JMP     LIMIT           /INHIBIT ERROR HALT
2246  12ØØ              TAD     RETURN
2247  1Ø74              TAD     M1
225Ø  74Ø2              HLT                     /HALT WITH AC=ERROR LOC
2251  76Ø4      LIMIT,  LAS
2252  ØØ24              AND     SW4             /CHA[illegible] STACK LIMITS?
```

```
2253  7640              SZA CLA
2254  5777'             JMP     CHEXA           /YES
2255  5600              JMP I   RETURN          /NO


                /
                /ADDRESS ERROR TEST 1
                /
2256  0000      ERR1,   0
2257  2072              ISZ     COUNT           /ADDRESS ERROR OCCURRED
2260  7410              SKP
2261  5257              JMP     .-2
2262  7200              CLA
2263  1256              TAD     ERR1
2264  3547              DCA I   XRETUR          /STORE RETURN ADDRESS
2265  1270              TAD     .+3
2266  3551              DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
2267  7410              SKP
2270  2307              PERR1
2271  1135              TAD     K6100
2272  3340              DCA     Z24             /TEST 1
2273  7604      ERR1A,  LAS
2274  0022              AND     SW2             /BELL ON ERROR?
2275  7640              SZA CLA
2276  5206              JMP     RBELL           /YES
2277  7604              LAS
2300  0021              AND     SW1             /INHIBIT ERROR TYPEOUT?
2301  7640              SZA CLA
2302  5550              JMP I   XSTOP           /YES
2303  2053              ISZ     HEAD1
2304  7410              SKP
2305  4776'             JMS     HEAD12          /TYPEOUT ERROR HEADING
2306  5546              JMP I   XCODER          /GO TO ERROR ROUTINE

2307  1064      PERR1,  TAD     STKTST
2310  7112              CLL RTR
2311  7010              RAR
2312  1131              TAD     K4060
2313  3526              DCA     Z20             /FIELD OF ERROR
2314  4545              JMS I   XSIXTY
2315  0057              TESTAD
2316  2327              Z21                     /FAILING ADDRESS
2317  4545              JMS I   XSIXTY
2320  0066              GDATA
2321  2332              Z22                     /GOOD
2322  4545              JMS I   XSIXTY
2323  0065              BDATA
2324  2335              Z23                     /BAD
2325  4544              JMS I   XMESAG
2326  0000      Z20,    0
2327  0000      Z21,    0
2330  0000              0                       /FAILING ADDRESS
2331  4040              4040
2332  0000      Z22,    0
2333  0000              0                       /GOOD
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        2334  4040             4040
        2335  0000     Z23,    0
        2336  0000             0                   /BAD
        2337  4040             4040
        2340  0000     Z24,    0                   /TEST
        2341  5550             JMP I   XSTOP

                       /
                       /ADDRESS ERROR TEST 2
```

```
                        /
     2342  ØØØØ         ERR2,   Ø
     2343  2Ø72                 ISƵ     COUNT           /ADDRESS ERROR OCCURRED
     2344  741Ø                 SKP
     2345  5343                 JMP     .-2
     2346  72ØØ                 CLA
     2347  1342                 TAD     ERR2
     235Ø  3547                 DCA I   XRETUR          /STORE RETURN ADDRESS
     2351  1354                 TAD     .+3
     2352  3551                 DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
     2353  741Ø                 SKP
     2354  23Ø7                 PERR1
     2355  1136                 TAD     K62ØØ
     2356  334Ø                 DCA     Ƶ24             /TEST 2
     2357  5273                 JMP     ERR1A

     2376  2477
     2377  Ø214
           24ØØ                 PAGE

                        /
                        /ADDRESS ERROR TEST 3
                        /
     24ØØ  ØØØØ         ERR3,   Ø
     24Ø1  2Ø72                 ISƵ     COUNT           /ADDRESS ERROR OCCURRED
     24Ø2  741Ø                 SKP
     24Ø3  52Ø1                 JMP     .-2
     24Ø4  72ØØ                 CLA
     24Ø5  12ØØ                 TAD     ERR3
     24Ø6  3547                 DCA I   XRETUR          /STORE RETURN ADDRESS
     24Ø7  1212                 TAD     .+3
     241Ø  3551                 DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
     2411  741Ø                 SKP
     2412  23Ø7                 PERR1
     2413  1137                 TAD     K63ØØ
     2414  3777'                DCA     Ƶ24             /TEST 3
     2415  5776'                JMP     ERR1A

                        /
                        /ADDRESS ERROR TEST 4
                        /
     2416  ØØØØ         ERR4,   Ø
     2417  2Ø72                 ISƵ     COUNT           /ADDRESS ERROR OCCURRED
     242Ø  741Ø                 SKP
     2421  5217                 JMP     .-2
     2422  72ØØ                 CLA
     2423  1216                 TAD     ERR4
     2424  3547                 DCA I   XRETUR          /STORE RETURN ADDRESS
     2425  123Ø                 TAD     .+3
     2426  3551                 DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
     2427  741Ø                 SKP
     243Ø  23Ø7                 PERR1
     2431  114Ø                 TAD     K64ØØ
     2432  3777'                DCA     Ƶ24             /TEST 4
     2433  5776'                JMP     ERR1A
```

```
                    /
                    /RELOCATION MOVE ERROR OCCURRED
                    /
      2434  ØØØØ    ERRM,   Ø
      2435  2Ø72            ISZ     COUNT           /RELO ERROR OCCURRED
      2436  741Ø            SKP
      2437  5235            JMP     .-2
      244Ø  72ØØ            CLA
      2441  1234            TAD     ERRM
      2442  3547            DCA I   XRETUR          /STORE RETURN ADDRESS
      2443  1246            TAD     .+3
      2444  3551            DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
      2445  5546            JMP I   XCODER
      2446  2447            PERRM

      2447  1Ø64    PERRM,  TAD     STKTST
      245Ø  7112            CLL RTR
      2451  7Ø1Ø            RAR
      2452  1131            TAD     K4Ø6Ø
      2453  327Ø            DCA     Z1Ø
      2454  4545            JMS I   XSIXTY
      2455  ØØ67            MOVE
      2456  2471            Z11
      2457  4544            JMS I   XMESAG
      246Ø  22Ø5            TEXT                    "RELO ERR AT "
      2461  1417
      2462  4ØØ5
      2463  2222
      2464  4ØØ1
      2465  244Ø
      2466  ØØØØ
      2467  4544            JMS I   XMESAG
      247Ø  ØØØØ    Z1Ø,    Ø
      2471  ØØØØ    Z11,    Ø
      2472  ØØØØ            Ø
      2473  ØØØØ            Ø
      2474  724Ø            STA
      2475  3Ø53            DCA     HEAD1
      2476  555Ø            JMP I   XSTOP

                    /
                    /TYPEOUT TEST 1 OR 2 ERROR HEADING
                    /
      2477  ØØØØ    HEAD12, Ø
      25ØØ  4544            JMS I   XMESAG
      25Ø1  4543            TEXT    "%#PR LOC   ADDR   GOOD  BAD  TEST"
      25Ø2  2Ø22
      25Ø3  4Ø14
      25Ø4  17Ø3
      25Ø5  4Ø4Ø
      25Ø6  4ØØ1
      25Ø7  Ø4Ø4
      251Ø  224Ø
      2511  4Ø4Ø
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2512  Ø717
2513  17Ø4
2514  4Ø4Ø
2515  Ø2Ø1
2516  Ø44Ø
2517  4Ø24
252Ø  Ø523
2521  24ØØ
2522  5677            JMP I   HEAD12

2576  2273
2577  234Ø
      26ØØ            PAGE

              /
              /TYPEOUT PROGRAM TITLE
              /
26ØØ  ØØØØ    TITLE,  Ø
26Ø1  4544            JMS I   XMESAG
26Ø2  4543            TEXT            "%##EA8-E EXT MEM ADDR TEST#"
26Ø3  43Ø5
26Ø4  Ø17Ø
26Ø5  55Ø5
26Ø6  4ØØ5
26Ø7  3Ø24
261Ø  4Ø15
2611  Ø515
2612  4ØØ1
2613  Ø4Ø4
2614  224Ø
2615  24Ø5
2616  2324
2617  43ØØ
262Ø  56ØØ            JMP I   TITLE

              /
              /TYPEOUT TO SET SWITCHES
              /
2621  ØØØØ    SETSW,  Ø
2622  4544            JMS I   XMESAG
2623  4543            TEXT            "%#SETUP SR & CONT"
2624  23Ø5
2625  2425
2626  2Ø4Ø
2627  2322
263Ø  4Ø46
2631  4ØØ3
2632  1716
2633  24ØØ
2634  74Ø2            HLT                     /WAIT FOR SWITCH SETTING
2635  5621            JMP I   SETSW
              /
              /TYPEOUT 'NO PROGRAM RELOCATION WILL OCCUR'
              /
2636  ØØØØ    PNOREL, Ø
```

```
2637 4544               JMS I   XMESAG
2640 4543               TEXT            "%#NO RELOCATION, PROG IN STACK "
2641 1617
2642 4022
2643 0514
2644 1703
2645 0124
2646 1117
2647 1654
2650 4020
2651 2217
2652 0740
2653 1116
2654 4023
2655 2401
2656 0313
2657 4000
2660 6224               RIF
2661 7106               CLL RTL
2662 7004               RAL
2663 1132               TAD     K6000
2664 3266               DCA     Z8
2665 4544               JMS I   XMESAG
2666 0000       Z8,     0
2667 7240               STA
2670 3053               DCA     HEAD1           /RESET ERROR HEADING
2671 5636               JMP I   PNOREL
                /
                /PROGRAM RELOCATION WILL OCCUR
                /
2672 0000       PREL,   0
2673 4544               JMS I   XMESAG
2674 4543               TEXT            "%#PROG WILL RELOCATE"
2675 2022
2676 1707
2677 4027
2700 1114
2701 1440
2702 2205
2703 1417
2704 0301
2705 2405
2706 0000
2707 7240               STA
2710 3053               DCA     HEAD1           /RESET ERROR HEADING
2711 5672               JMP I   PREL
                /
                /TYPEOUT 'PROGRAM IS IN SELECTED FIELD'
                /
2712 4544       PINF,   JMS I   XMESAG
2713 4543               TEXT            "%#PROGRAM IN SELECTED FIELD"
2714 2022
2715 1707
2716 2201
2717 1540
```

```
2720  1116
2721  4023
2722  Ø514
2723  Ø5Ø3
2724  24Ø5
2725  Ø44Ø
2726  Ø611
2727  Ø514
273Ø  Ø4ØØ
2731  5777'         JMP     CHEXA           /SETUP SWITCHES AGAIN
              /
              /TYPEOUT 'NONE' FOR NO LEGAL STACK SELECTION
              /
2732  4544    NOSTK,  JMS I   XMESAG
2733  1617            TEXT    "NONE"
2734  16Ø5
2735  ØØØØ
2736  5777'           JMP     CHEXA



              /
              /FIND HIGHEST STACK NUMBER IN THIS SYSTEM
              /
2737  ØØØØ    HIGHST, Ø
274Ø  73ØØ            CLA CLL
2741  3Ø6Ø            DCA     KBINT           /CLEAR HIGH STACK COUNTER
2742  6211            CDF1
2743  4776'           JMS     CSS             /CHECK FOR FIELD 1
2744  6221            CDF2
2745  4776'           JMS     CSS             /CHECK FOR FIELD 2
2746  6231            CDF3
2747  4776'           JMS     CSS             /CHECK FOR FIELD 3
275Ø  6241            CDF4
2751  4776'           JMS     CSS             /CHECK FOR FIELD 4
2752  6251            CDF5
2753  4776'           JMS     CSS             /CHECK FOR FIELD 5
2754  6261            CDF6
2755  4776'           JMS     CSS             /CHECK FOR FIELD 6
2756  6271            CDF7
2757  4776'           JMS     CSS             /CHECK FOR FIELD 7
276Ø  5737    KHIGH,  JMP I   HIGHST
2776  3ØØØ
2777  Ø214
      3ØØØ            PAGE
              /
              /CHECK IF SELECTED STACK IS IN SYSTEM
              /
3ØØØ  ØØØØ    CSS,    Ø
3ØØ1  73ØØ            CLA CLL
3ØØ2  6224            RIF
3ØØ3  1141            TAD     K62Ø1
3ØØ4  321Ø            DCA     CSSB
3ØØ5  1Ø74            TAD     M1
3ØØ6  3615            DCA I   CHECK
```

```
 3ØØ7  1615           TAD I   CHECK
 3Ø1Ø  62Ø1    CSSB,  CDF     ØØ             /PROGRAM DATA FIELD
 3Ø11  765Ø           SNA CLA                /SKIP IF STACK IS IN SYSTEM
 3Ø12  5777'          JMP     KHIGH
 3Ø13  2Ø6Ø           ISZ     KBINT          /INCREMENT STACK COUNTER
 3Ø14  56ØØ           JMP I   CSS

 3Ø15  3Ø16    CHECK, CHECKØ
 3Ø16  ØØØØ    CHECKØ, Ø


               /
               /TYPEOUT NUMBER OF STACKS IN SYSTEM
               /
 3Ø17  ØØØØ    TSTSYS, Ø
 3Ø2Ø  4544           JMS I XMESAG
 3Ø21  4543           4543
 3Ø22  ØØØØ           ØØØØ
 3Ø23  1Ø6Ø           TAD     KBINT
 3Ø24  7ØØ1           IAC
 3Ø25  4543           JMS I   XTYPE          /TYPEOUT NUMBER
 3Ø26  4544           JMS I   XMESAG
 3Ø27  4Ø23           TEXT          " STACKS IN THIS SYSTEM"
 3Ø3Ø  24Ø1
 3Ø31  Ø313
 3Ø32  234Ø
 3Ø33  1116
 3Ø34  4Ø24
 3Ø35  1Ø11
 3Ø36  234Ø
 3Ø37  2331
 3Ø4Ø  2324
 3Ø41  Ø515
 3Ø42  ØØØØ
 3Ø43  5617           JMP I   TSTSYS

               /
               /TYPEOUT CHARACTER IN THE AC AND A SPACE
               /
 3Ø44  ØØØØ    TYPESP, Ø
 3Ø45  4543           JMS I   XTYPE          /TYPEOUT CHAR IN AC
 3Ø46  1115           TAD     K24Ø
 3Ø47  4543           JMS I   XTYPE          /TYPE A SPACE
 3Ø5Ø  5644           JMP I   TYPESP
               /
               /RESTORE STACKS FOR RELOCATION
               /
 3Ø51  ØØØØ    RESTK, Ø
 3Ø52  72ØØ           CLA
 3Ø53  1Ø3Ø           TAD     STACKØ
 3Ø54  3Ø4Ø           DCA     STKØ
 3Ø55  1Ø31           TAD     STACK1
 3Ø56  3Ø41           DCA     STK1
 3Ø57  1Ø32           TAD     STACK2
```

```
        3Ø6Ø  3Ø42              DCA     STK2
        3Ø61  1Ø33              TAD     STACK3
        3Ø62  3Ø43              DCA     STK3
        3Ø63  1Ø34              TAD     STACK4
        3Ø64  3Ø44              DCA     STK4
        3Ø65  1Ø35              TAD     STACK5
        3Ø66  3Ø45              DCA     STK5
        3Ø67  1Ø36              TAD     STACK6
        3Ø7Ø  3Ø46              DCA     STK6
        3Ø71  1Ø37              TAD     STACK7
        3Ø72  3Ø47              DCA     STK7
        3Ø73  5651              JMP I   RESTK


                    /
                    /TYPEOUT STACKS SELECTED FOR TESTING
                    /
        3Ø74  ØØØØ  TOSEL,  Ø
        3Ø75  4544              JMS I   XMESAG
        3Ø76  4543              TEXT            "%#STACKS SEL'D ARE "
        3Ø77  2324
        31ØØ  Ø1Ø3
        31Ø1  1523
        31Ø2  4Ø23
        31Ø3  Ø514
        31Ø4  47Ø4
        31Ø5  4ØØ1
        31Ø6  22Ø5
        31Ø7  4ØØØ
        311Ø  1Ø37              TAD     STACK7
        3111  764Ø              SZA CLA
        3112  5315              JMP     .+3
        3113  1126              TAD     K267
        3114  4244              JMS     TYPESP          /STACK 7 IS SELECTED
        3115  1Ø36              TAD     STACK6
        3116  764Ø              SZA CLA
        3117  5322              JMP     .+3
        312Ø  1125              TAD     K266
        3121  4244              JMS     TYPESP          /STACK 6 IS SELECTED
        3122  1Ø35              TAD     STACK5
        3123  764Ø              SZA CLA
        3124  5327              JMP     .+3
        3125  1124              TAD     K265
        3126  4244              JMS     TYPESP          /STACK 5 IS SELECTED
        3127  1Ø34              TAD     STACK4
        313Ø  764Ø              SZA CLA
        3131  5334              JMP     .+3
        3132  1123              TAD     K264
        3133  4244              JMS     TYPESP          /STACK 4 IS SELECTED
        3134  1Ø33              TAD     STACK3
        3135  764Ø              SZA CLA
        3136  5341              JMP     .+3
        3137  1122              TAD     K263
        314Ø  4244              JMS     TYPESP          /STACK 3 IS SELECTED
        3141  1Ø32              TAD     STACK2
```

```
      3142  7640              SZA CLA
      3143  5346              JMP     .+3
      3144  1121              TAD     K262
      3145  4244              JMS     TYPESP          /STACK 2 IS SELECTED
      3146  1031              TAD     STACK1
      3147  7640              SZA CLA
      3150  5353              JMP     .+3
      3151  1120              TAD     K261
      3152  4244              JMS     TYPESP          /STACK 1 IS SELECTED
      3153  1030              TAD     STACK0
      3154  7640              SZA CLA
      3155  5360              JMP     .+3
      3156  1117              TAD     K260
      3157  4244              JMS     TYPESP          /STACK 0 IS SELECTED
      3160  5674              JMP I   TOSEL


                    /
                    /TWO SPECIAL SCOPE LOOPS
                    /

      3177  2/60
            3400    *3400
      3400  7604    LOOP1,  LAS                     /SWITCH ADDRESS
      3401  3206            DCA     SWAD
      3402  1206            TAD     SWAD
      3403  3606            DCA I   SWAD
      3404  1606            TAD I   SWAD
      3405  5200            JMP     LOOP1

      3406  0000    SWAD,   0

            3600    *3600
      3600  7604    LOOP2,  LAS                     /READ LOWER LIMIT
      3601  3224            DCA     FIRST
      3602  7402            HLT
      3603  7604            LAS                     /READ UPPER LIMIT
      3604  3225            DCA     LAST
      3605  1224    LOOP2A, TAD     FIRST
      3606  3226            DCA     SWAD0
      3607  1226    LOOP2B, TAD     SWAD0
      3610  3626            DCA I   SWAD0
      3611  1626            TAD I   SWAD0
      3612  7200            CLA
      3613  1226            TAD     SWAD0
      3614  7041            CIA
      3615  1225            TAD     LAST
      3616  7650            SNA CLA
      3617  5205            JMP     LOOP2A
      3620  2226            ISZ     SWAD0
      3621  5207            JMP     LOOP2B
      3622  7402            HLT                     /HALT RESULTED IN ILLEGAL LIMITS
      3623  5200            JMP     LOOP2

      3624  0000    FIRST,  0
```

```
        3625  0000    LAST,   0
        3626  0000    SWADØ,  0

                      $
```

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ØØØØ  1111ØØØØ  ØØØØØØØØ  11111111  11111111  11111111  11111111  11111111  11111111
Ø1ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØØØ

Ø2ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø3ØØ  11111111  11111111  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØ111  11111111  11111111

Ø4ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø5ØØ  11111111  11111111  11111111  11111111  1111ØØØØ  ØØØØØØØØ  ØØØØØ111  11111111

Ø6ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø7ØØ  11111111  11111111  11111111  11111111  11111111  11111111  111ØØØØØ  ØØØØØØ11


1ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
11ØØ  11111111  11111111  11111111  11111111  11111111  1111111Ø  ØØØØØØØØ  11111111

12ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
13ØØ  11111111  1ØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  11111111

14ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
15ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1111111Ø  ØØØØØ111

16ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
17ØØ  11111111  11111111  11111111  11111111  11111111  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØ11


2ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
21ØØ  11111111  11111111  11ØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ

22ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
23ØØ  11111111  11111111  11111111  11111111  11111111  11111111  ØØØØØØØØ  ØØØØØØ11

24ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
25ØØ  11111111  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØ11

26ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
27ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØ11


3ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
31ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØØ1

32ØØ
33ØØ

34ØØ  1111111Ø  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
35ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ

36ØØ  11111111  11111111  1111111Ø  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
37ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
```

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4ØØØ
41ØØ

42ØØ
43ØØ

44ØØ
45ØØ

46ØØ
47ØØ


5ØØØ
51ØØ

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53ØØ

54ØØ
55ØØ

56ØØ
57ØØ


6ØØØ
61ØØ

62ØØ
63ØØ

64ØØ
65ØØ

66ØØ
67ØØ


7ØØØ
71ØØ

72ØØ
73ØØ

74ØØ
75ØØ

76ØØ
77ØØ
```

```
        ABOVE   1706            CHEXN9  0761            K215    0114            MIN51   0155
        ADDER   2241            CHEXO   1000            K24Ø    0115            MIN52   0156
        ADDER1  1273            CHEXOØ  1024            K245    0116            MIN53   0157
        ADDER2  1424            CHEXO1  1040            K26Ø    0117            MIN54   016Ø
        ADDER3  1476            CHEXO2  1054            K261    0120            MOVE    ØØ67
        ADDER4  155Ø            CHEXO3  107Ø            K262    0121            MSRGHT  2066
        ADDRT1  1264            CHEXO4  1104            K263    0122            MSSL    1742
        ADDRT2  1415            CHEXO5  1120            K264    0123            MTP     2120
        ADDRT3  1466            CHEXO6  1134            K265    0124            NORELO  ØØ5Ø
        ADDRT4  154Ø            CHEXO7  1144            K266    0125            NOSTK   2732
        BDATA   ØØ65            CHEXOA  1006            K267    0126            PERR1   23Ø7
        BELOW   1725            CHKSW3  164Ø            K3Ø     0104            PERRM   2447
        CBFØ    62Ø3            CIFØ    62Ø2            K34Ø    0127            PINF    2712
        CBF1    6213            CIF1    6212            K4Ø     0105            PNOREL  2636
        CBF2    6223            CIF2    6222            K4Ø6Ø   0131            PREL    2672
        CBF3    6233            CIF3    6232            K5Ø     0106            RBELL   22Ø6
        CBF4    6243            CIF4    6242            K6Ø     0107            RDF     6214
        CBF5    6253            CIF5    6252            K6ØØØ   0132            RELO    1646
        CBF6    6263            CIF6    6262            K6ØØ3   0133            RELO2   1665
        CBF7    6273            CIF7    6272            K6Ø6Ø   0134            RELO3   1667
        CDFØ    62Ø1            CINT    62Ø4            K61ØØ   0135            RELO4   1672
        CDF1    6211            CNV     2Ø24            K62ØØ   0136            RELO5   17Ø3
        CDF2    6221            CODERR  22Ø1            K62Ø1   0141            RESTK   3Ø51
        CDF3    6231            COUNT   ØØ72            K62Ø3   0142            RETURN  22ØØ
        CDF4    6241            CSS     3ØØØ            K63ØØ   0137            RIB     6234
        CDF5    6251            CSSB    3Ø1Ø            K64ØØ   014Ø            RIF     6224
        CDF6    6261            CUF     6264            K7      0101            RMF     6244
        CDF7    6271            DOWN    1736            K7Ø     011Ø            RTF     6ØØ5
        CHECK   3Ø15            ERR1    2256            K7Ø7    013Ø            RUNØ    16ØØ
        CHECKØ  3Ø16            ERR1A   2273            K77     0111            RUN1    16Ø5
        CHEXA   Ø214            ERR2    2342            KABOVE  ØØ51            RUN2    1612
        CHEXB   Ø253            ERR3    24ØØ            KBELOW  ØØ52            RUN3    1617
        CHEXC   Ø262            ERR4    2416            KBINT   ØØ6Ø            RUN4    1624
        CHEXC1  Ø274            ERRLOC  ØØ73            KDOWN   ØØ7Ø            RUNTST  ØØ56
        CHEXD   Ø3Ø2            ERRM    2434            KHIGH   276Ø            SAME    1631
        CHEXD1  Ø31Ø            ERRORØ  2233            LAST    3625            SETSW   2621
        CHEXE   Ø317            ERROR1  2234            LEGAL   Ø41Ø            SINT    6254
        CHEXE2  Ø4ØØ            ESL     ØØ62            LEGALØ  ØØ55            SIXTY   2ØØØ
        CHEXM   Ø476            EXTAD   Ø2ØØ            LEGALA  Ø463            SIXTYØ  2Ø37
        CHEXM1  Ø5Ø3            EXTADØ  Ø2Ø5            LIMIT   2251            SIXTY1  2Ø4Ø
        CHEXM2  Ø51Ø            FIRST   3624            LOOP1   34ØØ            SIXTY2  2Ø41
        CHEXM3  Ø515            FIVE    Ø152            LOOP2   36ØØ            SSL     ØØ61
        CHEXN   Ø527            GDATA   ØØ66            LOOP2A  36Ø5            STACKØ  ØØ3Ø
        CHEXNØ  Ø53Ø            GTF     6ØØ4            LOOP2B  36Ø7            STACK1  ØØ31
        CHEXN1  Ø6ØØ            HEAD1   ØØ53            M1      ØØ74            STACK2  ØØ32
        CHEXN2  Ø622            HEAD12  2477            M2      ØØ75            STACK3  ØØ33
        CHEXN3  Ø64Ø            HIGHST  2737            M3      ØØ76            STACK4  ØØ34
        CHEXN4  Ø656            INSAME  ØØ54            M34     Ø1ØØ            STACK5  ØØ35
        CHEXN5  Ø674            K1Ø     Ø1Ø2            M4      ØØ77            STACK6  ØØ36
        CHEXN6  Ø712            K2Ø     Ø1Ø3            MESAGE  2Ø5Ø            STACK7  ØØ37
        CHEXN7  Ø73Ø            K2Ø7    Ø112            MIN5    Ø153            STKØ    ØØ4Ø
        CHEXN8  Ø746            K212    Ø113            MIN5Ø   Ø154            STK1    ØØ41
        STK2    ØØ42            Z1Ø     247Ø
        STK3    ØØ43            Z11     2471
        STK4    ØØ44            Z2Ø     2326
        STK5    ØØ45            Z21     2327
        STK6    ØØ46            Z22     2332
        STK7    ØØ47            Z23     2335
        STKPIN  ØØ63            Z24     234Ø
        STKTST  ØØ64            Z8      2666
        STOP    2242
        SUF     6274
        SWØ     ØØ2Ø
        SW1     ØØ21
        SW2     ØØ22
        SW3     ØØ23
        SW4     ØØ24
        SW5     ØØ25
        SW68    ØØ26
        SW911   ØØ27
        SWAD    34Ø6
        SWADØ   3626
        TDF1    1252
        TDF2    14Ø2
        TDF3    1445
        TDF4    1516
        TEMP    ØØ71
        TEST    12ØØ
        TEST1   125Ø
        TEST1A  1253
        TEST1B  1257
        TEST2   14ØØ
        TEST2A  14Ø3
        TEST2B  141Ø
        TEST3   1443
        TEST3A  1446
        TEST3B  1456
        TEST4   1514
        TEST4A  1517
        TEST4B  153Ø
        TESTAD  ØØ57
        TITLE   26ØØ
        TOSEL   3Ø74
        TSTSYS  3Ø17
        TYPE    2Ø42
        TYPECH  2Ø67
        TYPESP  3Ø44
        XADDER  Ø151
        XCODER  Ø146
        XMESAG  Ø144
        XRETUR  Ø147
        XSIXTY  Ø145
        XSTOP   Ø15Ø
        XTYPE   Ø143
```

```
ERRORS DETECTED: Ø
LINKS GENERATED: 133
RUN-TIME:  13 SECONDS
3K CORE USED
```